Honeywell

FireForce 8

NOTIFICATION APPLIANCE CIRCUIT EXPANDER

INSTALLATION & OPERATION MANUAL

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Fire Alarm System Limitations

While a fire alarm system may lower insurance rates, it is not a substitute for fire insurance!

An automatic fire alarm system—typically made up of smoke detectors, heat detectors, manual pull stations, audible warning devices, and a fire alarm control panel with remote notification capability—can provide early warning of a developing fire. Such a system, however, does not assure protection against property damage or loss of life resulting from a fire.

The Manufacturer recommends that smoke and/or heat detectors be located throughout a protected premise following the recommendations of the National Fire Protection Association Standard 72 (NFPA 72), manufacturer's recommendations, State and local codes, and the recommendations contained in the Guides for Proper Use of System Smoke Detectors, which are made available at no charge to all installing dealers. These documents can be found at http://www.systemsensor.com/html/applicat.html. A study by the Federal Emergency Management Agency (an agency of the United States government) indicated that smoke detectors may not go off in as many as 35% of all fires. While fire alarm systems are designed to provide early warning against fire, they do not guarantee warning or protection against fire. A fire alarm system may not provide timely or adequate warning, or simply may not function, for a variety of reasons:

Smoke detectors may not sense fire where smoke cannot reach the detectors such as in chimneys, in or behind walls, on roofs, or on the other side of closed doors. Smoke detectors also may not sense a fire on another level or floor of a building. A second-floor detector, for example, may not sense a first-floor or basement fire.

Particles of combustion or “smoke” from a developing fire may not reach the sensing chambers of smoke detectors because:

- Barriers such as closed or partially closed doors, walls, or chimneys may inhibit particle or smoke flow.
- Smoke particles may become “cold,” stratify, and not reach the ceiling or upper walls where detectors are located.
- Smoke particles may be blown away from detectors by air outlets.
- Smoke particles may be drawn into air returns before reaching the detector.

The amount of “smoke” present may be insufficient to alarm smoke detectors. Smoke detectors are designed to alarm at various levels of smoke density. If such density levels are not created by a developing fire at the location of detectors, the detectors will not go into alarm.

Smoke detectors, even when working properly, have sensing limitations. Detectors that have photoelectronic sensing chambers tend to detect smoldering fires better than flaming fires, which have little visible smoke. Detectors that have ionizing-type sensing chambers tend to detect fast-flaming fires better than smoldering fires. Because fires develop in different ways and are often unpredictable in their growth, neither type of detector is necessarily best and a given type of detector may not provide adequate warning of a fire.

Smoke detectors cannot be expected to provide adequate warning of fires caused by arson, children playing with matches (especially in bedrooms), smoking in bed, and violent explosions (caused by escaping gas, improper storage of flammable materials, etc.).

Heat detectors do not sense particles of combustion and alarm only when heat on their sensors increases at a predetermined rate or reaches a predetermined level. Rate-of-rise heat detectors may be subject to reduced sensitivity over time. For this reason, the rate-of-rise feature of each detector should be tested at least once per year by a qualified fire protection specialist. Heat detectors are designed to protect property, not life.

IMPORTANT! Smoke detectors must be installed in the same room as the control panel and in rooms used by the system for the connection of alarm transmission wiring, communications, signaling, and/or power. If detectors are not so located, a developing fire may damage the alarm system, crippling its ability to report a fire.

Audible warning devices such as bells may not alert people if these devices are located on the other side of closed or partly open doors or are located on another floor of a building. Any warning device may fail to alert people with a disability or those who have recently consumed drugs, alcohol or medication. Please note that:

- Strobes can, under certain circumstances, cause seizures in people with conditions such as epilepsy.
- Studies have shown that certain people, even when they hear a fire alarm signal, do not respond or comprehend the meaning of the signal. It is the property owner's responsibility to conduct fire drills and other training exercise to make people aware of fire alarm signals and instruct them on the proper reaction to alarm signals.
- In rare instances, the sounding of a warning device can cause temporary or permanent hearing loss.

A fire alarm system will not operate without any electrical power. If AC power fails, the system will operate from standby batteries only for a specified time and only if the batteries have been properly maintained and replaced regularly.

Equipment used in the system may not be technically compatible with the control panel. It is essential to use only equipment listed for service with your control panel.

Telephone lines needed to transmit alarm signals from a premise to a central monitoring station may be out of service or temporarily disabled. For added protection against telephone line failure, backup radio transmission systems are recommended.

The most common cause of fire alarm malfunction is inadequate maintenance. To keep the entire fire alarm system in excellent working order, ongoing maintenance is required per the manufacturer's recommendations, and UL and NFPA standards. At a minimum, the requirements of NFPA 72 shall be followed. Environments with large amounts of dust, dirt or high air velocity require more frequent maintenance. A maintenance agreement should be arranged through the local manufacturer's representative. Maintenance should be scheduled monthly or as required by National and/or local fire codes and should be performed by authorized professional fire alarm installers only. Adequate written records of all inspections should be kept.

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Installation Precautions

Adherence to the following will aid in problem-free installation with long-term reliability:

WARNING - Several different sources of power can be connected to the fire alarm control panel. Disconnect all sources of power before servicing. Control unit and associated equipment may be damaged by removing and/or inserting cards, modules, or interconnecting cables while the unit is energized. Do not attempt to install, service, or operate this unit until manuals are read and understood.

CAUTION - System Re-acceptance Test after Software Changes: To ensure proper system operation, this product must be tested in accordance with NFPA 72 after any programming operation or change in site-specific software. Re-acceptance testing is required after any change, addition or deletion of system components, or after any modification, repair or adjustment to system hardware or wiring. All components, circuits, system operations, or software functions known to be affected by a change must be 100% tested. In addition, to ensure that other operations are not inadvertently affected, at least 10% of initiating devices that are not directly affected by the change, up to a maximum of 50 devices, must also be tested and proper system operation verified.

This system meets NFPA requirements for operation at 0-49º C/32-120º F and at a relative humidity 93% ± 2% RH (non-condensing) at 32°C ± 2°C (90°F ± 3°F). However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a normal room temperature of 15-27º C/60-80º F.

Verify that wire sizes are adequate for all initiating and indicating device loops. Most devices cannot tolerate more than a 10% I.R. drop from the specified device voltage.

Like all solid state electronic devices, this system may operate erratically or can be damaged when subjected to lightning induced transients. Although no system is completely immune from lightning transients and interference, proper grounding will reduce susceptibility. Overhead or outside aerial wiring is not recommended, due to an increased susceptibility to nearby lightning strikes. Consult with the Technical Services Department if any problems are anticipated or encountered.

Disconnect AC power and batteries prior to removing or inserting circuit boards. Failure to do so can damage circuits.

Remove all electronic assemblies prior to any drilling, filing, reaming, or punching of the enclosure. When possible, make all cable entries from the sides or rear. Before making modifications, verify that they will not interfere with battery, transformer, or printed circuit board location.

Do not tighten screw terminals more than 9 in-lbs. Over-tightening may damage threads, resulting in reduced terminal contact pressure and difficulty with screw terminal removal.

This system contains static-sensitive components. Always ground yourself with a proper wrist strap before handling any circuits so that static charges are removed from the body. Use static suppressive packaging to protect electronic assemblies removed from the unit.

Follow the instructions in the installation, operating, and programming manuals. These instructions must be followed to avoid damage to the control panel and associated equipment. FACP operation and reliability depend upon proper installation.

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FCC Warning

WARNING: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual may cause interference to radio communications. It has been tested and found to comply with the limits for class A computing devices pursuant to Subpart B of Part 15 of FCC Rules, which is designed to provide reasonable protection against such interference when devices are operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user will be required to correct the interference at his or her own expense.

Canadian Requirements

This digital apparatus does not exceed the Class A limits for radiation noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de la classe A prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

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Section 1: Introduction

1.1 General Description

The FIREFORCE 8 is a notification appliance circuit extender panel designed to extend the power capabilities of the existing notification appliance circuits and provide power for other ancillary devices.

An FIREFORCE 8 panel consists of two notification appliance circuit inputs and four class B, style Y, two class A, style Z, or two class B and one class A notification appliance circuits. Two class B (1 class A) circuits will always be controlled by the first input, the other two class B (1 class A) circuits may be operated from either input. Each of these output circuits is capable of providing 3.0 amps of power limited notification appliance power and are supplied from an 8 Amp, 24 VDC power supply. Using the optional Class A Adapter, PN 31076, four class A outputs at 2.5A each may be obtained. Outputs may follow the inputs, or be programmed to provide temporal outputs for a steady input They can also be programmed to provide strobe and horn synchronizing signals when none are on the input. The internal sync. signals can permit horns and strobes to be connected to a single wire pair on each output, controlled by the two inputs, or they can be separated and operated on individual outputs. All inputs and outputs are supervised for open or shorted conditions. EOL resistor values can be changed by connecting a sample EOL resistor to the unit. This allows compatibility with existing NAC circuits. An internal battery charger is also provided with the FIREFORCE 8 to provide standby battery operation. The panel is mounted in a rigid sheet metal enclosure with the dimensions of (12 5/8"W x 18"H x 4 1/2"D).

1.2 Functional Description

1.2.1 Normal Quiescent Operation

In the normal quiescent condition the green Power On LED is illuminated indicating AC line operation. The yellow TRBL LEDs are off indicating that all supervision circuits are normal.

1.2.2 Alarm Condition

Whenever an alarm condition occurs at the Main FACP the resultant 24V output from its indicating circuit will energize the connected polarity sensing inputs. This input will then activate the notification appliance output circuits on the FIREFORCE 8 according to how they are programmed. Input 1 will always control Outputs 1 and 2. Input 2 normally controls Outputs 3, and 4 (Default) however this pair of outputs can be programmed to operate from Input 1. The FIREFORCE 8 notification appliance circuits will follow steady, march time, temporal or coded signals from the main control panel, and will pass on strobe and horn synchronization signals if they are present on the input.

When the unit is programmed to generate synchronization signals, combined horn and strobe synchronization signals are placed on each selected output pair and turned on and off by the inputs in the manner described as default above.

NOTE: When the unit is programmed to generate synchronization signals and have all four outputs controlled by input 1, the strobe synchronization signals are placed on all four outputs when input 1 is active. When input 1 and 2 are active, the horn synchronization signals are combined with the strobe synchronization signals on all four outputs. In this manner, horns and strobes can be connected to same pair of wires on any output, and be controlled separately.

1.2.3 Reset

The FIREFORCE 8 will return to the quiescent condition automatically upon restoration of the Main FACP to normal operation

1.2.4 Trouble Condition

A trouble condition is indicated by a TRBL LED illuminating and the common Form “C” TROUBLE FAIL relay contacts transferring. The trouble signal will be transmitted to the Main FACPs by opening the Indicating Circuits that are used to control the FIREFORCE 8. An alarm from the main control panel will override a trouble condition.

The FIREFORCE 8 monitors its output notification appliance circuits for an open or shorted condition. Notification appliance circuits with a short circuit trouble can not be activated.

A trouble is indicated by any one of the following conditions:

Indicator	Name	Trouble Condition
LED 8	PWR ON	A brown-out or black-out AC line condition
LED 7	AUX TRBL	A low or missing output, or a short circuit on the AUXilliary output
LED 6	BATT TRBL	A low or missing battery
LED 5	GF TRBL	An earth fault on external wiring
LED 4, 3, 2, 1	SIG(4,3,2,1) TRBL	A short circuit or an open on a supervised notification appliance circuit

1.2.5 Normal AC Power Failure

When the AC fails or falls below 100VAC at the 120VAC setting or 190VAC at the 240VAC setting, the FIREFORCE 8 will go into the Trouble condition. It will switch to Battery Operation, deactivate the *Trouble* and *Power Fail* relays, extinguish the AC On LED (LED 8), and transmit the trouble over the input Signal Circuits.

1.2.6 Delayed AC Power Failure

When S7 *AC 6HR* is set (Dialer Operation) An AC failure will be handled in the same manner as above EXCEPT the *TROUBLE* relay will not transfer, and the failure notification will not be transmitted over the input Signal Circuits until the failure has existed for 6 hours. The *POWER FAIL* relay will transfer in order to provide an external trouble indication.

1.2.7 Battery Operation

Indicated by the extinguishing of the green Power On LED.

Standby operation occurs whenever the main power source fails or falls below 100VAC @ 120VAC setting or 190VAC @ 240VAC setting. In this situation the FIREFORCE 8 will automatically transfer system operation to the standby battery set without the loss of any alarm condition present prior to the transfer. The FIREFORCE 8 panel will transfer back to the main power source when the operating voltage returns to 105VAC @ 120VAC setting or 194VAC @ 240VAC setting. Should the battery become disconnected, have a blown fuse, or develop low voltage, the FIREFORCE 8 will indicate a Battery fault and light LED 2. Replace batteries when required.

1.3 Electrical Operating Characteristics

Input Voltage	120 VAC @ 3.3 Amps or 240 VAC @ 2 Amps (Jumper selected)50/60 Hz.
Input Control Signal	10VDC to 30VDC, or 12V to 28V Full Wave Rectified, Polarity Reversing.
Output Voltage	24 Volt DC @ 8Amps
NAC outputs 1- 4	3.0 Amps Maximum per output.
NAC outputs 1- 4 With optional Class A adapter	2.5 Amps Maximum per output.
AUX Power	0.15 Amps under all conditions. 2.0 Amps if load is removed during operation from battery.
Total System Current	Total loading on all outputs shall not exceed 8 Amps.

Section 2: Installation

2.1 Mounting Instructions

The standard mounting is a surface mount cabinet. The unit must be securely attached to a permanent partition using suitable fasteners. Four mounting holes are provided to accept 1/4-inch dia. screws max. There are nine combination knockouts provided, located three on the top and three on each side of the cabinet. Knockouts can accept 1/2, or 3/4 inch conduit.

2.2 Electrical Connections

For field wiring connections, refer to Inter-equipment Wiring DWG. No. B-W479 in Appendix C.1.

2.3 Function of Input/Output Connections

2.3.1 AC Connections

120VAC or 240VAC connects to the AC Terminal Block on the Power Supply

Connections for the A.C. Mains J1 Terminal		
L1 (Hot)	GND	L2 (Neutral)

WARNING: When installing to operate from 240VAC, it is necessary to remove the jumper E1 - E2 on the power supply printed circuit board. Failure to do so will result in damage to the power supply when AC voltage is applied.

2.3.2 Battery Connections

Batteries connect to the BATT+, BATT- terminals. Sealed Lead Acid Batteries are required to provide 24 Volts DC @ 8 Amps max. The maximum battery size allowable is 26AH. Larger battery packs with there own enclosures and chargers can be accommodated by removing the jumper on J1, which disables the internal battery charger. Connect ONLY using a 15A fuse.

Connections for the Battery TB1 TERMINALS	
BATT+	BATT-

2.3.3 24 VDC Out Terminals (Power Limited)

Auxiliary Power Output @ 24 Volts DC, 150 mA, (2.0 Amps maximum if an external disconnect is used during periods of power failure). Two terminals are provided (+, -). Power limited output of 2.0 amps. (Deduct the current used from the 8 Amps total system load).

Connections for the Auxiliary 24VDC TB4 TERMINALS	
A+	A-

2.3.4 Earth Ground

Connect to Earth Ground on the Power Supply module.

Earth Ground Connections J1 Terminals	
GND	

2.3.5 Trouble Relay

The common trouble relay is a normally energized Form C relay that transfers when the FIREFORCE 8 detects a trouble condition. The contacts are rated for 2 amps @ 30VDC with a power factor of 0.6 or higher.

Trouble Fail TB2 Terminals		
NC	Comm	NO

2.3.6 Power Fail

The Power Fail relay is a normally energized Form C relay that transfers when a power failure or brown out condition exists. The contacts are rated for 2 amps @ 30VDC with a power factor of 0.6 or higher.

Power Fail TB2 Terminals		
NC	Comm	NO

2.3.7 Extender Output Circuit Wiring (Power Limited)

The FIREFORCE 8 Notification Appliance Circuit outputs can provide up to 3.0 Amps (power limited) of 24 VDC each (total panel output is limited to 8 Amps). The outputs can be arranged as 4 Style Y (Class B), 2 Style Z (Class A) or 1 Style Z and 2 Style Y circuits. The EOL resistor value for Style Y wiring is 3.9K ohms unless a reference resistor of a different value is used. Terminals (n) L1 and (n) L2 are connections for style Y (Class B) wiring These designations are preceded by the circuit number (n). When Style Z (Class A) wiring is used, terminal 1L1 will return to terminal 2L1 and terminal 1L2 will return to terminal 2L2, likewise, terminal 3L1 will return to terminal 4L1 and terminal 3L2 will return to terminal 4L2 for the second Class A circuit. **Terminal L1 switches negative and terminal L2 switches positive during alarm condition.** Either pair of circuits can be designated Class A or Class B independently of the other pair.

Style Z - Class A Notification Appliance Circuit Connections Terminals				**Circuit**	**Style Y - Class B Notification Appliance Circuit Connections Terminals**	
1L1	2L1	1L2	2L2	1	1L1	2L2
-	-	-	-	2	2L1	2L2
3L1	4L1	3L2	4L2	3	3L1	3L2
-	-	-	-	4	4L1	4L2

2.3.8 Reference EOL Resistor (*Power Limited)*

To accommodate existing Notification Appliance circuits that have EOL resistors of various values, provisions are made to attach a reference EOL resistor, matching the existing EOL, within the range of 2.0K to 25.0K ohms. **Normally, a 3.9K resistor should be attached to the Ref. Terminals**. All Style Y (Class B) outputs must have EOL resistors of the same value as the reference resistor. EOL values outside of the 2.0K – 25.0 K range will cause all of the Style Y NAC output Trouble LEDs to light steady.

Ref TB3 Terminals	
REF+	REF-

2.3.9 Input signal wiring (*Power Limited)*

The main FACP notification appliance circuit inputs are +IN, -IN. When polarity is reversed on the main FACP notification appliance circuit, the output circuits on the FIREFORCE 8 will activate according to their programming. These inputs restore when the Main FACP circuit is restored. +IN and -IN are internally connected to +OUT and -OUT for connection to devices beyond the FIREFORCE 8. Should a trouble condition occur, the circuit is opened. If an alarm is received during trouble the circuit is restored to allow devices beyond the FIREFORCE 8 to be operated. Signal 1 always activates output Signal Circuits 1 and 2., and depending on the position of switch SW1-8 can also control output Signal Circuits 3 and 4. Otherwise, Signal 2 controls output Signal Circuits 3 and 4.

NOTE: When the Strobe Sync. Added mode is selected, and Ckts. 3 and 4 are controlled by Input 1, and a single input is to control both the Horns and the Strobes, The Output of Input 1 should be connected to the Input of Input 2, and the signal Ckt. continuation or EOL resistor should be connected to the output of Input 2.

Signal 1 Terminals	1+IN	1-IN	1+OUT	1-OUT
Signal 2 Terminals	2+IN	2-IN	2+OUT	2-OUT

Section 3: Function of Switches, LEDs and Jumpers

3.1 Programming Switches

Outputs 1 & 2		
SW-1.1	SW-1.2	Function
SIG1/2A	SIG1/2B	
Open	Open	Output follows the Input (Also passes Sync. signals) Should **NOT** be used for Full Wave Rectified inputs
Closed	Open	Steady Input, Temporal Output
Open	Closed	Steady Input, Steady Output, Strobe Sync. added
Closed	Closed	Steady input, steady output, noise eliminated. (Does **NOT** pass Sync. signals)
Outputs 3 & 4		
SW-1.3	SW-1.4	Function
SIG3/4A	SIG3/4	
Open	Open	Output follows the Input (Also passes Sync. signals) Should **NOT** be used for Full Wave Rectified inputs
Closed	Open	Steady Input, Temporal Output
Open	Closed	Steady Input, Steady Output, Strobe Sync. added
Closed	Closed	Steady input, steady output, noise eliminated. (Does **NOT** pass Sync. signals)

Sync. Codes **(Used ONLY if synchronizes. Added option is selected with switch 1-1 through 4)**		
SW-1.5	SW-1.6	Function
SYN/SEL A	SYN/SEL B	
Open	Open	Gamewell Sync and Wheelock Sync
Closed	Open	System Sensor Sync
Open	Closed	Faraday Sync and Amseco Sync
Closed	Closed	Gentex Sync

Power Fail Reporting	
SW-1.7	Function
AC 6HR	
Open	TROUBLE FAIL reported immediately on power failure
Closed	TROUBLE FAIL delayed for 6 hours on power failure

Input Select	
SW-1.8	Function
SIG SEL	
Closed	Outputs 3 / 4 controlled by Input 2
Open	Outputs 3 / 4 controlled by Input 1, also in Strobe Sync. Added mode, Input 1 controls strobe synch. signals and, Input 2 controls the horn synch. signals, both of which can be combined on all 4 outputs.

3.2 Function of LED Indicators

INDICATOR	LED#	Color	Description
PWR ON	LED # 8	Green	Indicates AC line operation.
AUX TRBL	LED # 7	Yellow	Indicates a short or overload on the Aux. Output.
BATT TRBL	LED # 6	Yellow	Indicates a low battery voltage or missing battery.
GF TRBL	LED # 5	Yellow	Indicates an external wiring connection is not adequately isolated from the earth ground.
NAC #4	LED # 4	Yellow	Indicates a short or open circuit in the external wiring.
NAC #3	LED # 3	Yellow	Indicates a short or open circuit in the external wiring.
NAC #2	LED # 2	Yellow	Indicates a short or open circuit in the external wiring.
NAC #1	LED # 1	Yellow	Indicates a short or open circuit in the external wiring.

3.3 Jumper Functions

3.3.1 Jumper J1

When the jumper on J1 is in place, the internal Battery Charger is enabled. To disable the charger and allow an external charger to maintain the batteries, remove this jumper.

3.3.2 Jumper J2

When the jumper on J2 is in place, the FF 8 performs its own ground fault tests. When the power supply common is connected to the power supply common of another device, such as when a common battery is used for a FACP and the FF8, remove this jumper.

3.4 Optional Class A Adapter

The optional Class A Adapter allows the connection of four class A NAC circuits to the FireForce 8. This is a passive device that uses no power from the FF8. Install the adapter as described in Drawing A-M1192, and attach the field wiring according to Drawing B-W479-4 in Appendix C.1.

Section 4: Operation

4.1 Start-up Procedure

Connect A.C. first, then connect batteries

4.2 Operating Instructions

4.2.1 Alarm Condition

Alarm devices operate in unison with the Main FACP alarm devices. The alarm-activated outputs are reset through operation of the Reset switch on the Main FACP.

4.2.2 Trouble Condition

The associated trouble LED (yellow) will illuminate.

4.2.3 Testing and Maintenance

System Testing should be performed periodically to insure proper operation.

1. Test the indicating circuits by initiating an alarm or test at the Main FACP.
2. Test for proper operation by actuating the notification appliance circuit the FIREFORCE 8 is monitoring.
3. Standby batteries and AC transfer are tested by interrupting the AC power line while an alarm test condition exists (see 1 above).

4.3 Battery Applications

4.3.1 Battery Capacity

Battery Capacity is 26 ampere-hours maximum for the FIREFORCE 8 using the internal battery charger. The max. charging rate is 0.75 amps. Larger capacity batteries can be used with the FireForce 8 if they are housed in an external UL listed enclosure, and use an external UL listed battery charger with sufficient capacity to restore the full charge to the batteries in the required time. To use an external battery charger, remove the jumper at J1. The alternate enclosure and battery charger shall be Listed for Fire Protective Signaling use.

Appendix A: Compatible Devices

A.1 Compatible Notification Devices

Part #	Catalog #	Part #	Catalog #	Part #	Catalog #
70871	MIZ-24-R	71562	SR-24110-HFR	71717	RSSP-24110W-FR
70873	MIZ-24-W	71569	RSP-241575-VFR	71727	AS-2415C-FW
71138	MT-12/24-R	71573	AMT-12/24-R	71728	AS-2430C-FW
71140	MT-24-WM-VFR	71574	AMT-24-LS-VFR	71729	AS-2475C-FW
71287	MIZ-24-LS-VFR	71575	AMT-24-IS-VFR	71730	RSS-2415C-FW
71288	MIZ-24-LSM-VFR	71576	AMT-24-LSM-VFR	71731	RSS-2430C-FW
71289	MIZ-24-MS-VFR	71614	MT4-12/24-R	71732	RSS-2475C-FW
71290	MIZ-24-IS-VFR	71616	SR-2475-VFR	71733	RSSP-2415W-FR
71292	MT-24 -LS-VFR	71679	AS-2415W-FR	71736	ET70-2415W-FR
71293	MT-24-LSM-VFR	71680	AS-241575W-FR	71737	ET70-241575W-FR
71294	MT-24-MS-VFR	71681	AS-2430W-FR	71738	ET70-2430W-FR
71295	MT-24-IS-VFR	71682	AS-2475W-FR	71739	ET70-2475W-FR
71426	MT-24 -SL-VFR	71683	AS-24110W-FR	71740	ET90-2415C-FW
71427	MT-24-SLM-VFR	71684	AS-24100C-FW	71741	ET90-2430C-FW
71543	AS-2415-VFR	71685	NH-12/24-R	71742	ET90-2475C-FW
71544	AS-241575-VFR	71686	NS-2415W-FR	71743	ET90-24100C-FW
71545	AS-2430-VFR	71687	NS-241575W-FR	71744	E70-2415W-FR
71546	AS-2475-VFR	71688	NS-2430W-FR	71745	E70-241575W-FR
71547	AS-24110-HFR	71689	NS-2475W-FR	71746	E70-2430W-FR
71548	SM-12/24-R	71690	NS-24110W-FR	71747	E70-2475W-FR
71549	DSM-12/24-R	71691	RSS-2415W-FR	71748	E70-24110W-FR
71550	RS-2415-VFR	71692	RSS-241575W-FR	71749	E90-2415C-FW
71551	SR-2415-VFR	71693	RSSP-241575W-FR	71750	E90-2430C-FW
71552	SRP-2415-VFR	71694	RSSP-2430W-FR	71751	E90-2475C-FW
71553	RS-241575-VFR	71695	RSS-2430W-FR	71752	E90-24100C-FW
71554	SRP-241575-VFR	71696	RSSP-2475W-FR	71758	CH90-24-W
71555	SR-241575-VFR	71697	RSS-2475W-FR	71759	CH70-24-R
71556	RS-2430-VFR	71698	RSS-24110W-FR	71760	CH70-2415W-FR
71557	RSP-2430-VFR	71699	RSS-24100C-FW	71761	CH70-241575W-FR
71558	RSP-2475-VFR	71711	AH-24WP-R	71762	CH70-2430W-FR
71559	RS-2475-VFR	71712	RS-2415W-FR	71763	CH70-2475W-FR
71560	RS-24110-HFR	71713	RS-241575W-FR	71764	CH70-24110W-FR
71561	SRP-24110-HFR	71714	W3MT-24-VFR		

A.2 Synchronized Horns and Strobes

System Sensor	Faraday	Gentex (Max 25 per ckt)	Wheelock	Gamewell	Amseco
SC2415_	2700 Sync Series	GEC Series	AS-24MCW	72032	SHW24-153075
SC241575_		GES Series	RSS-24MCW	72033	SLW24-153075
SC2430_		GEH Series		72035	SHW24W-75110
SC2475_				72036	SLW24W-75110
SC2495_					HW-24A
SC24115_					HW-24
SC24177_					
PC2415_					
PC241575_					
PC2430_					
PC2475_					
PC2495_					
PC24115_					
PC24177_					

Appendix B: FireForce 8 Battery Calculation Chart

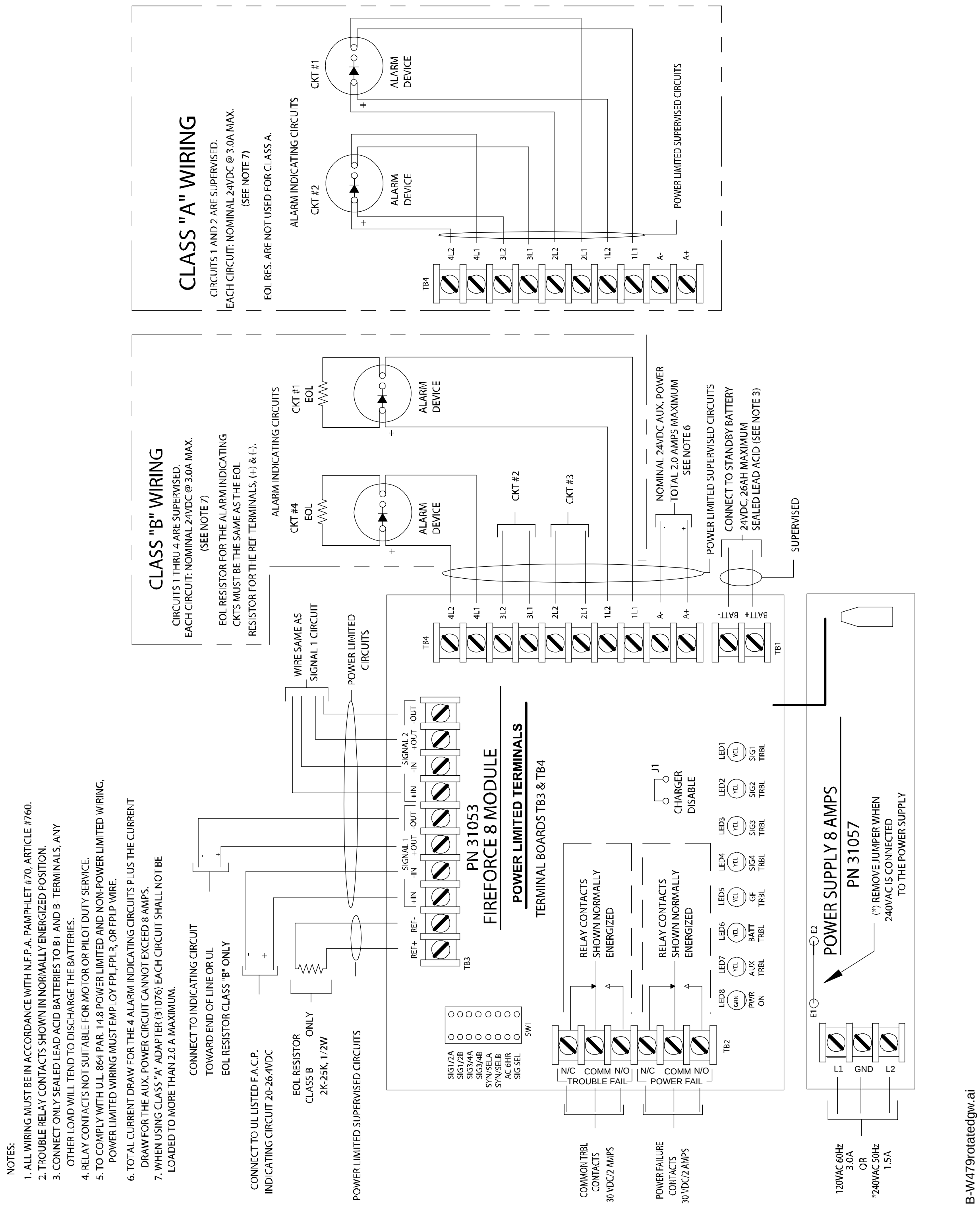
Circuit		Normal Current	Alarm Current
Notification Appliance Ckt. 1 Notification Appliance Ckt. 2			Cl A, .050A + Device Load 1 or Cl B, .065A + Device Load 1 & 2 Or Class A Adapter, .065A + Device Load 1 & 2
Notification Appliance Ckt. 3 Notification Appliance Ckt. 4			Cl A, .050A + Device Load 3 or Cl B, .065A + Device Load 3 & 4 Or Class A Adapter, .065A + Device Load 3 & 4
External Load A+, A- +/- 24 VDC			
Common Control		.030 A	.055 A
Normal Current (Total of Center Column)		Alarm Current (Total of Right Column)	
Hours of Standby	Total Normal Current		
X		=NORMAL Amp Hours	
Hours of Alarm	Total Alarm Current		
X		=ALARM Amp Hours	
		TOTAL Amp Hours	
		Safety Factor	X 1.25
		BATTERY AH REQUIRED 26 AH Max	

NOTE:

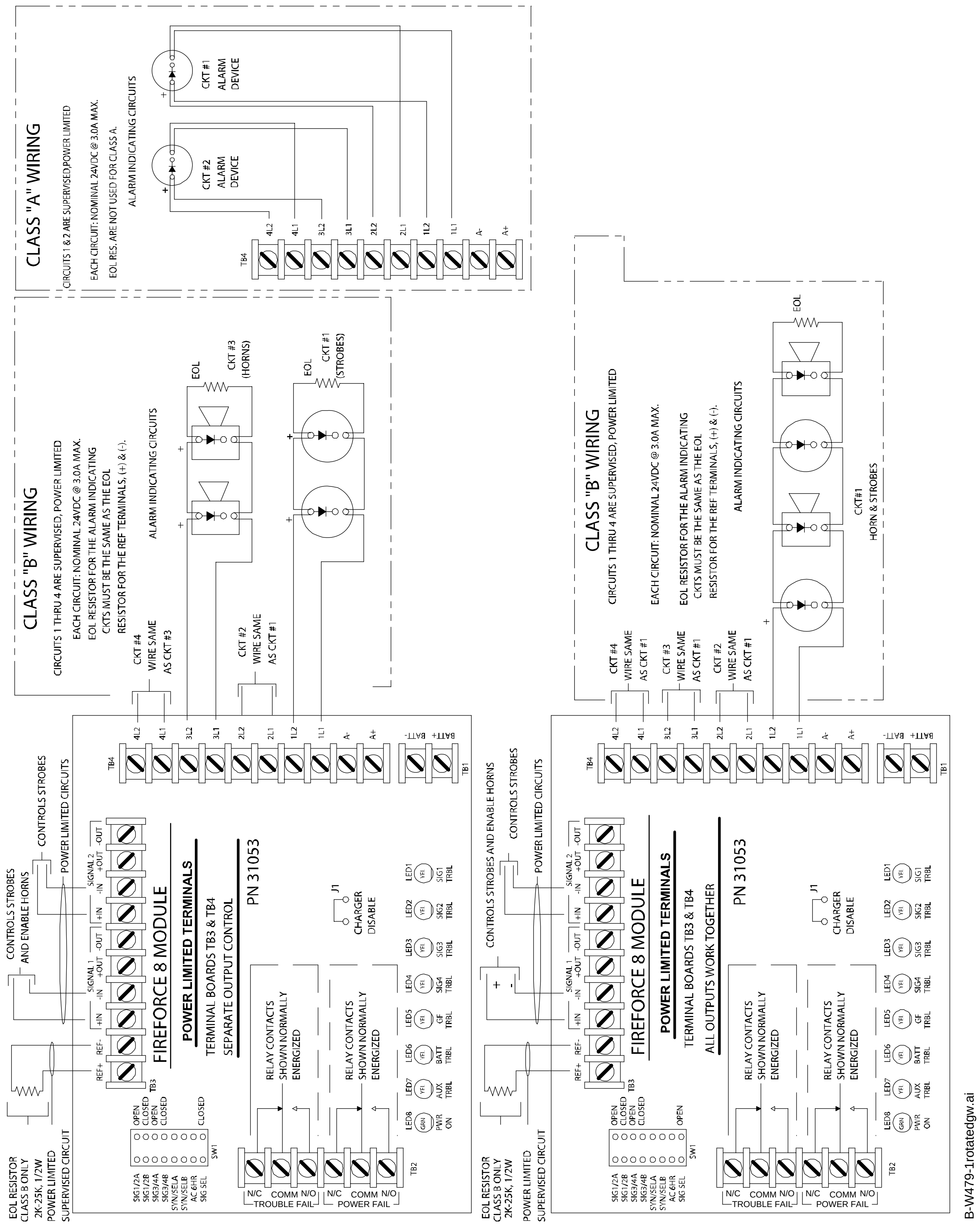
1. Normal current times total number of standby hours = Total Normal Amp Hours
2. Alarm current times total number hours of alarm = Total Alarm Amp Hours
3. Total normal Amp Hours + Total alarm Amp Hours + 25% = Minimum Battery Size
4. Total Load of Notification Appliance Ckt. And External Load Not To Exceed 8 Amps.

Appendix C: Wiring Drawings

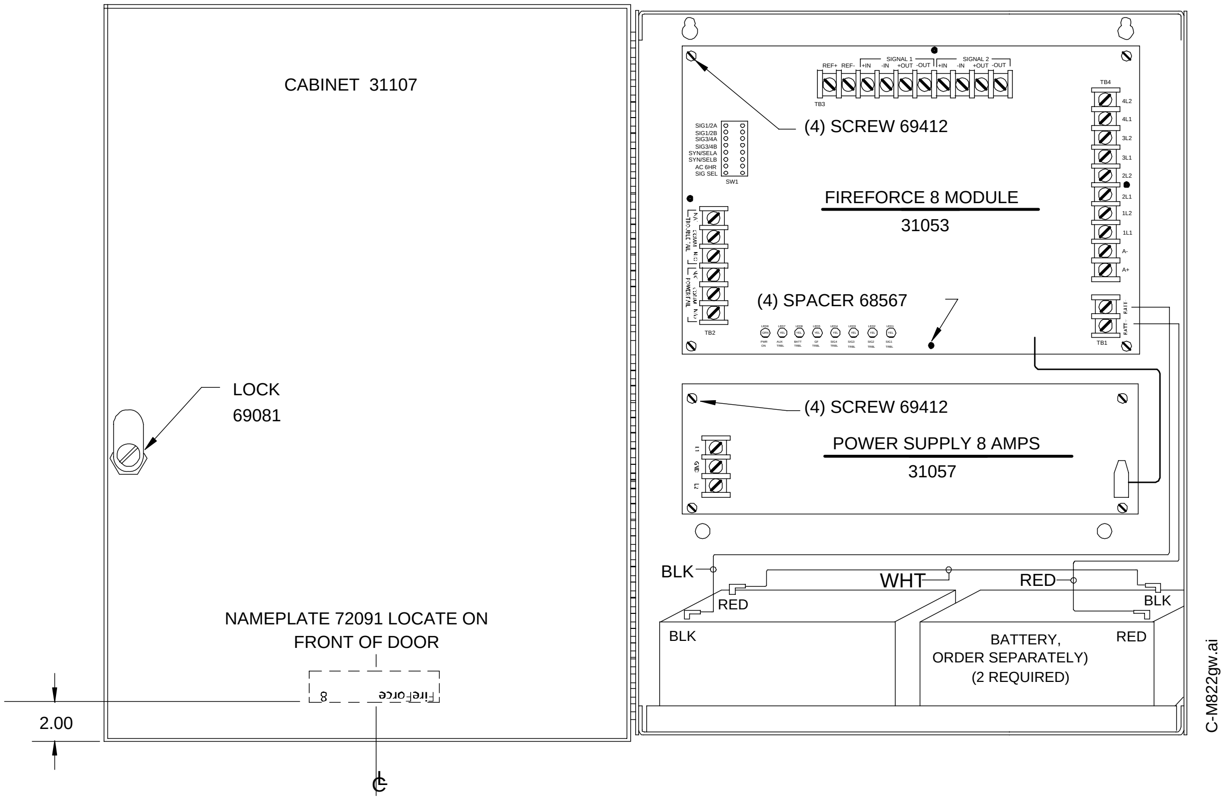
C.1 B-W479 Wiring Diagram: Notification Circuit Expander



C.2 B-W479-1 Wiring Diagram: Synchronized Horn & Strobe



C.3 C-M822, Assembly Drawing, FireForce 8 Cabinet



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